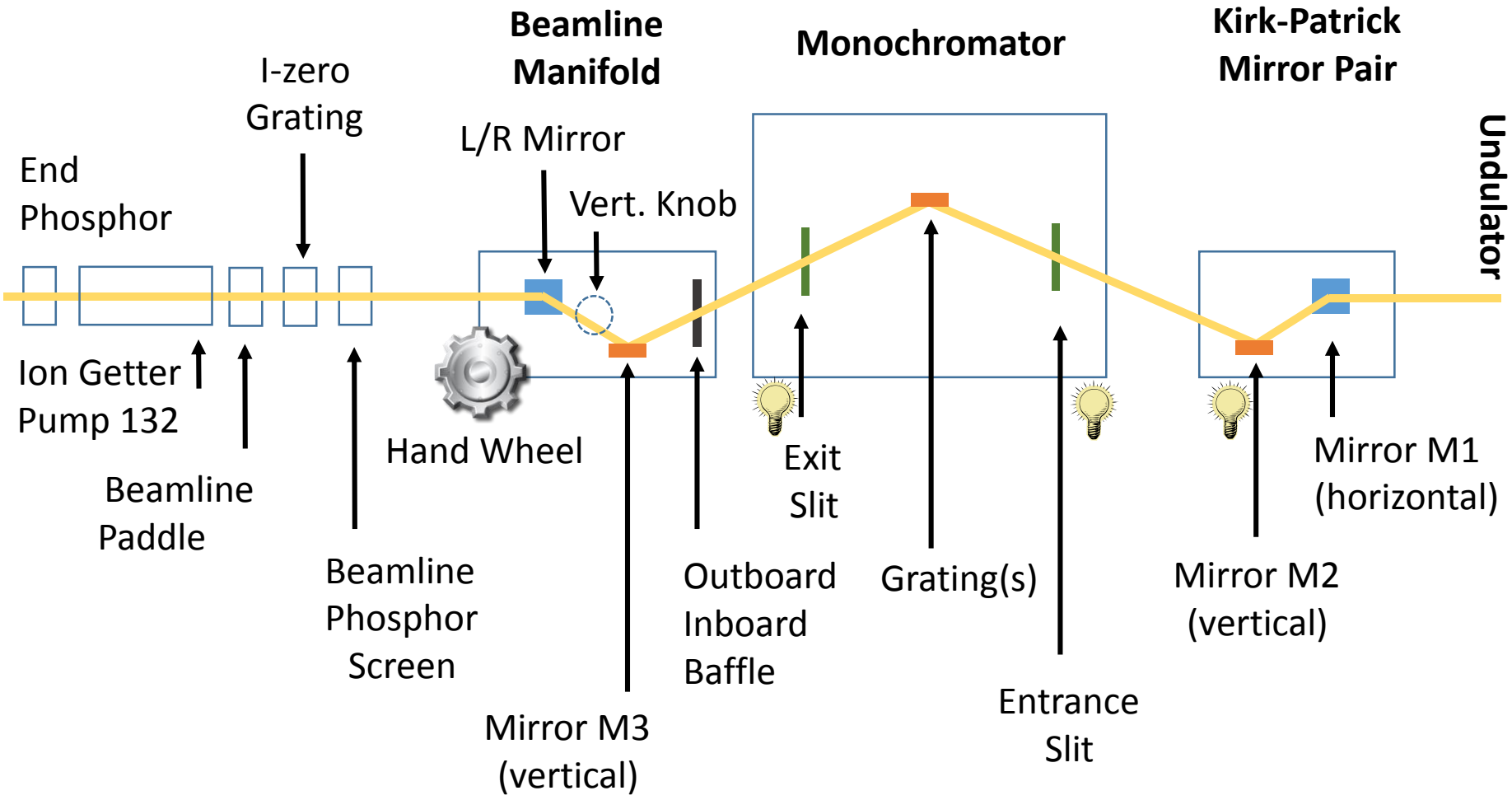
= bright light should be visible through glass flange when shutter is open

Beamline 10.0



Beamline range: Low Energy Grating goes from 18 to 75eV (can technically go up to 92eV but is not reliable anymore)

Contacts: A. Aguiliar & D. Kilcoyne

Support: W. Stolte

Scanning: Ask Brian Smith for right port number to actively control the BL via Ethernet

Get the beam through the beamline to your Endstation:

- You may have to switch the grating in the Monochromator first; if so: see last page
- Go to the Beamline Console panel
- Open Beamline Shutter
- Close other Beamline Valves (e.g. VR111) and set respective “EPS” offline
- Open your Beamline Valve (VR131 and VR132) and set respective “EPS” online
- Go on Beamline Computer and move out outboard & inboard baffle: set to 2 to 5mm (can be done in “Motor Display” & “Inboard/Outboard Baffle”)
- Bring in the beam horizontally to your Beamline by physically moving L/R Mirror with a handwheel (on beamline console side) so that the Aluminum Block on the post is lined up to “L”
- On the Beamline Computer change the M3 Mirror (“vertical focusing”) to 900V
- Dial in a start photon energy (“mono energy”) of 30 to 35eV with a resolution of 500meV (can be done in “beamline resolution” & “normal abs”)
- Enable “Exit Slit”, “ ID energy”, and “Energy Res” on “Gap Compensation”

- Go to the Beamline and physically carefully move down the I-zero grating to measure the current on the Keithley Ampere-meter (on beamline console side)
- On Beamline Computer ("Motor Display") optimize the "jog" of the M2 mirror in 2V steps to maximize the I-zero
- Try to see the light on Beamline Phosphor screen and then on the End-Phosphor screen
- Go back to Beamline Computer and reduce the outboard & inboard baffle: Drive in the Baffles till you cut 5 – 10 % on each side to cut out the higher harmonics to the left and right
- Put in the Beamline Paddle over the 1x1cm opening next to differential Ion Getter Pump 132 (line it up to the central line) and adjust the left/right beam position manually by moving the L/R Mirror with the hand wheel and the up/down position by turning the hidden "vert. knob" under the L/R Mirror: 50% goes on the paddle while 50% goes through. Take the paddle out.
- Then open Beamline Valve on grey box above the end of the beamline to get the beam to your endstation
- A typical resolution for data taking should be 10 to 30meV
- Typical values are 10microns at the entrance slit and 15microns at the exit slit

- The beamline performance will fluctuate during the warm-up period which can last a few hours: Especially the M2 mirror is sensitive and reacts to outside temperatures. Optimize the Jog in 2V steps by either looking at the I-zero grating or the electron or ion rate (bring rate via a BNC cable to a voltmeter close to the computer).
- After a couple of hours of operation redo the baffles again: Prevent the beam from going in the chamber (e.g. close the last shutter before the endstation or rotate a phosphor in). Set photon energy to ~35eV and open the slits (e.g. 200x600 microns). Bring in the I-zero grating and open each baffle to 3mm. Read the I-zero and cut the beam by 5-10% with the outboard baffle and then by 5-10% with the inboard baffle. Adjust the M2 mirror again in 2V steps for maximum I-zero. Close down the slits again (e.g. 15x15 microns) and let the beam in the endstation.
- Note that you can use the L/R Mirror to hit the target in the endstation

Changing the Grating in the Monochromator:

- We usually want the low energy grating (380l/mm)
- Go on the side next to the ring of the Monochromator and find the linear motion feedthrough in the middle of the tank (get yourself a stepstool to get up there).
- Peek through the 2.75in glass flange to the left of it to dock the linear feedthrough to the grating mount.
- Drive in the shaft of the feedthrough to the little funnel and lock the ensemble.
- Look to the monitor to the left: you need to line up the respective number to the respective mark (e.g. it's "2" for the low energy grating, "20" for the high energy grating)
- Move the grating by driving the shaft of the linear feedthrough in or out.
- Once the grating is in position detach the shaft of the linear feedthrough from the grating mount and retract it.
- Choose the right grating and harmonic on the beamline control computer.